



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Thomas Eckel et al.  
Serial No. : 10/007,465  
Filed : December 3, 2001  
For : POLYCARBONATE COMPOSITIONS  
Art Unit : 1712  
Examiner : D.J. Buttner

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DECLARATION

I, Thomas Eckel, residing at Pfauenstr. 51, 41540 Dormagen, Germany, declare as follows:

- 1) that I have the following technical education and experience:
  - a) I am a chemist having studied at the Phillips-Universität of Marburg, Germany, from 1978 to 1987,
  - b) I received the degree of doctor rer. nat. at the Phillips-Universität of Marburg in the year of 1987,
  - c) I am employed by Bayer AG since July 1987 in the Research Department especially handling polymer blends;
- 2) that the following tests were carried out under my immediate supervision and control:

## **Experimental results**

The compositions described in the table below were prepared on an injection moulding machine, Arburg 270 E type, at 240 °C and their properties determined. In addition to the indicated components, each composition further contained 0.4% PTFE and 0.4% of a conventional mold release agent, none believed to be critical to the invention.

**Table 1**

| <b>Composition</b>  | <b>7</b> | <b>8<br/>(comparison)</b> | <b>9</b> | <b>10<br/>(comparison)</b> |
|---|----------|---------------------------|----------|----------------------------|
| Polycarbonate <sup>1</sup> , %  | 70.0     | 70.0                      | 81.0     | 81.0                       |
| Impact strength modifier <sup>2</sup> , %                               | 10.7     | 10.7                      | 8.2      | 8.2                        |
| Vinyl(co)polymer <sup>3</sup> , %                                       | 5.5      | 5.5                       | --       | --                         |
| Phosphorous compound -2 <sup>4</sup> , %                                | --       | 13.0                      | --       | 10.0                       |
| Phosphorous compound -3 <sup>5</sup> , %                                | 13.0     | --                        | 10.0     | --                         |
|   |          |                           |          |                            |
| Properties:   |          |                           |          |                            |
| notch impact strength <sup>6</sup> @ -20°C (kJ/m <sup>2</sup> )         | 25       | 20                        | 38       | 26                         |
| Vicat B <sup>7</sup> 120 (°C)   | 103      | 94                        | 105      | 97                         |
| Flammability rating UL 94V, 1.6mm                                       | V-0      | V-0                       | V-0      | V-0                        |
| Stress cracking <sup>8</sup> - failure at 2.4% strain (minutes:seconds) | 4:38     | 3:42                      | 2:49     | 2:22                       |

-<sup>1</sup> Linear polycarbonate based on bisphenol A with a relative solution viscosity of 1.272, measured in CH<sub>2</sub>Cl<sub>2</sub> as solvent at 25 °C and a concentration of 0.5 g/100 ml.

-<sup>2</sup> Graft polymer consisting of 40 parts by wt. of a copolymer from styrene and acrylonitrile in the ratio of 72 : 28 on 60 parts by wt. of crosslinked polybutadiene rubber in particulate form (mean particle diameter d<sub>50</sub> = 0.32 µm), prepared by emulsion polymerization. By means of extraction in methyl ethyl ketone, subsequent precipitation and drying the rubber-containing portion B<sub>a</sub> is determined to be 80 wt.% and the rubber-free portion B<sub>b</sub> to be 20 wt.% (based on B).

-<sup>3</sup> Styrene/acrylonitrile copolymer with a styrene/acrylonitrile ratio by weight of 72 : 28 and an intrinsic viscosity of 0.55 dl/g (measurement in dimethyl formamide at 20 °C).

-<sup>4</sup> m-phenylene-bis (di-phenylphosphate),

- <sup>5</sup> Bisphenol-A-based oligophosphate,
- <sup>6</sup> in accordance with ISO 180/1 A.
- <sup>7</sup> according to DIN 53 460 (ISO 306) on rods 80 x 10 x 4 mm<sup>3</sup> in size
- <sup>8</sup> according to UL- 94 V on rods 127 x 12.7 x 1.6 mm in size produced on an injection molding machine at 240 °C.

The results show the critical dependence of notch impact strength at low temperatures, the softening temperature and the stress cracking resistance on the phosphorous compound. The inclusion of the claimed phosphorous compound offers significant advantages over a differently structured phosphorous compound.

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

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THOMAS ECKEL

Signed at Dormagen, this       day of       ,2005.